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09/746,018	12/26/2000	Jung-Yu Lee	Q62414	2272

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EXAMINER

NGUYEN, DILINH P

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 09/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/746,018

Applicant(s)

LEE ET AL.

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 19-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 4, 7, 10, 21 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Regarding claims 1, 7 and 21, the phrase: "...a plurality of printed circuit on the substrate..." is not understood.

Where are the plurality of printed circuit on the substrate?

- Regarding claims 4, 10 and 24, the claims have the limitation that the plurality of conductive adhesive tapes but the specification and drawings show the plurality of bonding wires.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 19-20, 22-23 and 25-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Egitto et al. (U.S. Pat. 6206997).

Egitto et al. disclose a semiconductor device (fig. 1, column 4, lines 3 et seq.) comprising:

- a substrate 10 having an underside;
- a die 30 positioned on the substrate;
- a plurality of signal transferring means electrically connected the die to the substrate;
- a protective sealant material 60 at least partially formed over the die and the plurality of signal transferring means, the protective sealant material having a top;
- a heat spreading device 90 operatively associated with the top of the protective sealant material; and

- a plurality of conductive means attached to the underside of the substrate.

- Regarding claim 20, Egitto et al. disclose an adhesive layer 40 between the die and the substrate.
- Regarding claim 22, Egitto et al. disclose the plurality of conductive means includes a plurality of solder balls.
- Regarding claim 23, Egitto et al. disclose the plurality of signal transferring means includes a plurality of bonding wires 20.
- Regarding claim 25, Egitto et al. disclose the heat spreading device can be made of metal (column 5, lines 8-9 and column 6, lines 32-33).
- Regarding claim 26, Egitto et al. disclose the sealant material has an adherent material 80 primed thereupon.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egitto et al. (U.S. Pat. 6206997).

Egitto et al. disclose a semiconductor device (fig. 1, column 4, lines 3 et seq.) comprising:

a substrate 10;

a die 30 located and supported on the substrate with an adhesive layer 40 between them;

a plurality of signal transferring means electrically connected the die to the substrate;

a sealant material 60 attached on the substrate and the die to seal and protect the die and the plurality of signal transferring means;

a heat spreading device 90 attached atop the sealant material to conduct heat from the die to ambient air; and

a plurality of conductive attached below the substrate. It would have been obvious to one having ordinary skill in the art to provide the plurality of conductive

means attached below the substrate to electrically connect a plurality of printed circuit on the substrate to external circuits.

- Regarding claim 2, Egitto et al. disclose the plurality of conductive means includes a plurality of solder balls.
- Regarding claim 3, Egitto et al. disclose the plurality of signal transferring means includes a plurality of bonding wires 20.
- Regarding claim 5, Egitto et al. disclose the heat spreading device can be made of metal (column 5, lines 8-9 and column 6, lines 32-33).
- Regarding claim 6, Egitto et al. disclose the sealant material has an adherent material 80 primed on it, wherein the adherent material 80 conducts heat from the die through the sealant material to the heat spreading device.
- Regarding claim 21, it would have been obvious in the art that the plurality of conductive means electrically connects the plurality of printed circuits and the external circuits.

7. Claims 4 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egitto et al. (U.S. Pat. 6206997) in view of Lepore, Jr. (U.S. Pat. 5609315).

Egitto et al. disclose the claimed invention except for the plurality of conductive adhesive tapes.

Lepore, Jr. discloses a semiconductor device (cover fig.) comprising a conductive adhesive tape 32 (column 3, lines 9-10) to reduce tearing of the blankets due to differences in the coefficient of expansion (column 3, lines 40-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was

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made to modify the device of Egitto et al. to reduce tearing of the blankets due to differences in the coefficient of expansion, as shown by Lepore, Jr.

8. Claims 7-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barrow (U.S. Pat. 6146921).

Barrow discloses a semiconductor device (fig. 1, column 2, lines 13 et seq.) comprising:

a substrate 14;

a die 12 located and supported on the substrate and it is inherent with an adhesive between them;

a plurality of signal transferring means which electrically connects the die to the substrate;

a sealant material 22 which seals and protect the die and the plurality of signal transferring means, wherein the sealant material has geometrically a concave 24 at the top surface of the center part;

a heat spreading device 26 which is attached atop the sealant material to conduct heat from the die to ambient air, wherein the heat spreading device has a downward bump 28 aligned to the concave; and

a plurality of conductive 18 means attached below the substrate. It would have been obvious to one having ordinary skill in the art to provide the plurality of conductive means attached below the substrate to electrically connect a plurality of printed circuit on the substrate to external circuits.

- Regarding claim 8, Barrow discloses the plurality of conductive means includes a plurality of solder balls 18.
  - Regarding claim 9, Barrow discloses the plurality of signal transferring means can be a plurality of bonding wires 16.
  - Regarding claim 11, Barrow discloses the heat spreading device 26 can be made of metal (column 2, lines 49-50).
  - Regarding claim 12, Barrow discloses the die has a thermally conductive epoxy 30, which conduct heat from the die through the sealant material to the heat spreading device (column 2, lines 51-56).
9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barrow in view of Lepore, Jr. (U.S. Pat. 5609315).

Barrow discloses the claimed invention except for the plurality of conductive adhesive tapes.

Lepore, Jr. discloses a semiconductor device (cover fig.) comprising a conductive adhesive tape 32 (column 3, lines 9-10) to reduce tearing of the blankets due to differences in the coefficient of expansion (column 3, lines 40-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Barrow to reduce tearing of the blankets due to differences in the coefficient of expansion, as shown by Lepore, Jr.

### ***Conclusion***



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, OLIK CHAUDHURI can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN  
September 11, 2002

  
Douglas Wille  
Patent Examiner

  
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